Theoretical and Methodological Foundations of Social Research

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Abstract

Research in the social sciences faces a paradox: the refinement of methodological instruments for measuring isolated variables has not improved the understanding of the global dynamics of the systems it aims to study. This limitation stems from a hegemonic paradigm that amalgamates metaphysical objectivism, Popperian logicism, methodological individualism, and fragmenting reductionism. In response, this article proposes a comprehensive research model for complex systems, based on an ecological perspective that integrates complex systems theory, the ecosystemic psychology of the act, and stakeholder analysis. It is founded on four pillars: (a) intentionality as a universal property of living systems, with its functions of reference, validation, and valence; (b) a multilevel ontology of agents and functional components; (c) the dynamic analysis of stakeholders and their changing roles; and (d) the characterization of sociocultural systems as complex and dynamic. Methodologically, it articulates eight active questions (who, what, how, why, how much, when, where) with a multilevel analysis protocol covering micro, meso, and macro scales. The validity of the model rests on immanent criteria: the internal coherence of the system and its capacity to satisfy universal human needs (personal, social, and natural). Its application to the educational system is exemplified, and its implications for research, policy evaluation, and social transformation are discussed.

Keywords: ecological research; complex systems; intentionality; stakeholders; human needs; comparative research.

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1. Introduction: The Need for a Paradigm Shift

Research in the social sciences and education is trapped in a paradox: the more methodological tools are refined to measure isolated variables, the less we

understand the global dynamics of the systems under study. This contradiction is rooted in a hegemonic paradigm that, as Mascarell (2024a) points out, amalgamates metaphysical objectivism, Popperian logicism, methodological individualism, and a reductionism that artificially fragments reality. The consequence is a science that describes linear statistical cause-effect correlations but is incapable of explaining the complex, intentional, and situated nature of educational and social processes.

Although stakeholder analysis is widely used in program evaluation and business management, it has suffered from a lack of systematic methodological developments for the comprehensive identification of these actors and their changing roles over time (McGinn & Welsh, 2001). Anchored in single-factor or simple multifactorial approaches, the hegemonic model tends to decontextualize phenomena and offer superficial, ethnocentric explanations that do not allow for a better understanding of them (Mascarell, 2018).

Against this backdrop, we propose a comprehensive research model for complex systems at different levels, based on an ecological perspective that integrates advances in complex systems theory, the ecosystemic psychology of the act, and stakeholder analysis. This model aims to overcome both the reductionism of traditional approaches and the relativism of stances that renounce any validation criteria, offering a robust theoretical and methodological framework for understanding and transforming sociocultural systems in their context.

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2. Theoretical Foundations of the Ecological-Integral Model

2.1. Intentionality as a Universal Property of Living Systems

The first theoretical pillar of our model is the conception of intentionality as a fundamental property of all living systems, not as an exclusive attribute of human consciousness. Mascarell (2024a) proposes three universal intentional functions that operate at all levels of complexity, from the cell to society:

a) **Reference**: the function by which a system cuts out, distinguishes, or brings forth a meaningful totality that becomes the "what" of its act. Empirical evidence is robust: from bacterial chemoreceptors that discriminate specific ligands (Koshland, 1981), through gestalt perception that organizes structured wholes (Köhler, 1929), to social processes that thematize public problems (Luhmann, 1984). Reference does not require consciousness; attention can operate implicitly, orienting the system toward certain contents without phenomenal experience (Bargh & Chartrand, 1999).

b) **Validation**: the function by which the system sanctions the relevance or viability of the reference in its coupling with the environment. The predictive coding framework offers the most complete model: the brain generates predictions and compares them with the actual signal, minimizing prediction error (Friston, 2010). This checking occurs massively at subpersonal levels, also manifesting in motor habits (Merleau-Ponty, 1945) and in social legitimation mechanisms (Berger & Luckmann, 1966).

c) **Valence**: the function by which the system assigns an affective-motivational charge to the presented and validated totality, orienting itself toward it by attraction or rejection. Affective neuroscience has identified brain systems dedicated to basic emotional states (Panksepp, 1998), and Damasio (1994) showed that somatic markers are indispensable for decision-making. Valence is not binary: it admits degrees, mixtures, and modulations, and its functional core is continuous with bacterial chemotaxis (Macnab & Koshland, 1972).

These three functions do not operate sequentially, but as co-occurring aspects of a single intentional act. This conception overcomes Brentano's (1874) consciousness-centered approach and offers an empirical basis for understanding the continuity between different levels of agency.

2.2. The Multilevel Ontology of Agents and Functional Components

The second theoretical pillar is an ontology that precisely distinguishes between systems that exercise intentionality and the components that integrate them. Following Mascarell (2024a, 2024b), we propose the following levels of agency: individual (person), group (team, family, class), community (neighborhood, association, club, school), and social (institutions, organizations, federations, companies, corporations). The relationship between these levels is not one of independence but of nested interdependence. Every agent inhabits and is part of a larger ecosystem that in turn constitutes it: the person as an individual agent and part of a group, a community, and a political and institutional society. This multilevel ontology allows for a non-reductionist science in which explaining is not eliminating, reducing, or isolating levels, but showing how the properties of one level emerge from the organization of its components and their coupling with adjacent levels (Anderson, 1972).

2.3. Stakeholders and Their Changing Roles

The third theoretical pillar comes from stakeholder analysis developed by McGinn and Welsh (2001). These authors define stakeholders as people or groups with a common interest in some particular action and its consequences, or who are affected by such action. The importance of this framework lies in recognizing that stakeholders change with the context and change the context, and that their participation varies according to the moment and type of task.

The methodology proposed by McGinn and Welsh (2001) includes matrices that cross these moments with tasks and activities, allowing for a comprehensive identification of stakeholders and their changing priorities.

2.4. The Complexity of Sociocultural Systems

The fourth theoretical pillar comes from the application of complex systems theory to sociocultural systems. Mascarell (2018) identifies four fundamental properties of these systems:

1. Orientation: living beings and their societies are intentional systems with a finalistic orientation. Therefore, it is essential to consider both the explicit or implicit interests of the research subjects and those of the researcher.
2. Connection: systems are composed of interdependent elements. It makes no sense to try to explain the development of one without considering its relationships with the others.
3. Hierarchization: the components of complex systems are organized into specialized levels according to needs and demands in a given domain. This must be considered when establishing and weighting relevant variables, determining causes, and assigning responsibilities.
4. Learning and evolution: systems are characterized by nonlinear coupling processes, meaning that linear cause-effect explanations are insufficient. Moreover, dynamic systems must be understood as learning systems both at the level of agents and social structure.

These properties demand a research approach that goes beyond both single-factor and simple multifactorial analysis, adopting an integral perspective that contemplates the complex network of relationships between agents and their environment.

2.5. The Normative Basis: Human Needs as Immanent Criteria

A recurrent objection to ecological and post-metaphysical approaches is that they lead to relativism or nihilism. Mascarell (2024b) responds to this objection by establishing a crucial distinction between needs and desires:

- **Human needs**: are limited, universal, and operate at three interrelated levels: personal, social, and natural. An act is more viable (more adequate, healthier, fairer) when it satisfies some human need without blocking the satisfaction of other needs in the system.
- **Desires**: are unlimited, culturally shaped, and can be functional or dysfunctional with respect to needs.

This immanent normative basis allows us to affirm that the proposed methodology is not arbitrary: its validity rests on its capacity to help people and collectives understand and transform their acts in directions that better satisfy their needs at the personal, social, and natural levels. The authority to propose it is not that of a logically demonstrated truth, but of its verifiable usefulness for human life in its ecological and social context.

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3. Integral Methodology for Research on Complex Systems

3.1. System Configuration and Constraints

To apply the proposed research model, we must start from the correct definition of the agents and constraints of the system and organize them on a scale (Table 1).

Agent	Time	Space	Norms	Purpose
Political manager Political/Administrative System (Level 4)	Life cycle	Society	Educational legislation	Include / Achieve cost-effectiveness
Principal/School Center (Level 3)	Educational cycles	School community	School regulations	Integrate / Promote
Teacher/Class Group (Level 2)	School year	Class group	Classroom rules	Teach / Pass
Student (Level 1)	Activity	Individual	Morals and values	Learn / Improve

Table 1. Configuration of the educational system by levels of agency

3.2. Multilevel Stakeholder Analysis

The third theoretical pillar comes from stakeholder analysis developed by McGinn and Welsh (2001). These authors define stakeholders as people or groups with a common interest in some particular action and its consequences, or who are affected by such action. The importance of this framework lies in recognizing that stakeholders change with the context and change the context, and that their participation varies according to the moment and type of task. The methodology proposed by McGinn and Welsh (2001) includes matrices that

cross these moments with tasks and activities, allowing for a comprehensive identification of stakeholders and their changing priorities.

Stakeholder Agent	Political/Administrative System Political manager	Principal/School Center	Teacher/Class Group	Student
Political-administrative system Political manager	Improve results or change curriculum / Improve demand or change supply	Improve cost-effectiveness or change schools / Improve results or change organization	Improve teacher training / Improve teacher distribution	Improve promotion criteria / Improve student distribution
School Center Director	Improve results or change schools	Improve relationships or change groups	Improve tasks or change activities	Improve teaching or change methodology
Class Group Teacher	Improve expectations or change fields of study	Improve results or change program	Improve relationships or change groups	Improve learning or change strategies
Student	Improve educational conditions or change the system	Improve school environment or change schools	Improve teaching practice or change teachers	Improve performance or change habits

Table 2. Intentions of stakeholder agents in the educational system

3.3. The Eight Active Questions as an Inquiry Tool

The proposed methodology is expressed by answering eight active questions that unfold the universal intentional functions (reference, validation, and valence) and anchor them in the concrete dimensions of each agent and the system as a whole: execution, history, time, and place. These questions are not a rigid algorithm but a heuristic guide for inquiring into situated acts (Table 3).

Question	Dimension	Intentional Function
Who?	The agent: physical, temperamental, biographical, competence, and relational characteristics	Reference

Question	Dimension	Intentional Function
What?	The totality that emerges as figure for the system	Reference
How?	Mode of execution: habits, bodily style, implicit knowledge	Reference/Validation
Why? (Purpose)	Systemic purpose: what the act maintains, protects, or pursues	Valence
Why? (Cause)	Causal genealogy: history of couplings, proximal triggers, remote causes	Validation
How much?	Intensity and sign of valence	Valence
When?	Temporality: rhythms, phases, cycles, opportune moment	Reference/Valence
Where?	Ecology of the act: physical environment, social niche, available affordances	Validation/Valence

Table 3. The eight active questions

In research practice, these questions are applied in five phases: (1) delimitation of the act and the agent who performs it; (2) systematic deployment of the eight questions; (3) attention to the implicit (gestures, routines, unthematized material conditions); (4) triangulation of perspectives when the act is collective; and (5) feedback to participants for intersubjective validation. The inclusion of the body and material context as sources of information is not ancillary; it is the direct consequence of conceiving cognition as embodied and situated (Merleau-Ponty, 1945; Clark, 1997).

3.4. Methodological Integration: An Ecological Research Protocol

The integration of the three methodological frameworks presented (system configuration, stakeholder analysis, and the eight active questions) gives rise to a research protocol that allows addressing complex systems at different scales. This protocol consists of six phases:

Phase 1: Ecological Delimitation of the System

- Define the boundaries of the system under study (micro, meso, or macro scale).
- Identify the agents operating at each level of agency.

- Characterize the physical, social, and normative environment in which it is embedded.
- Apply the “Where?” question to ecologically situate the act or process.

Phase 2: Structural Configuration Analysis

- Describe the organization of the system according to five dimensions: agents, time, space, norms, and purpose.
- Identify interdependencies between levels.
- Apply the “Who?” question to characterize agents in their physical, temperamental, biographical, and relational dimensions.

Phase 3: Identification of Stakeholders and Their Roles

- List all potential stakeholders in the categories of producers, distributors, and users.
- Identify the moments when they are most likely to be involved.
- Apply the “When?” question to understand the temporality of processes.
- Apply the “What?” question to define the meaningful totalities that emerge for each agent.

Phase 4: Analysis of Intentions and Motivations

- Construct the matrix of agents' intentions.
- Identify the valences (attractions and rejections) that guide actions.
- Apply the “Why?” (purpose) question to understand systemic purposes.
- Apply the “How much?” question to assess the intensity and sign of valence.

Phase 5: Analysis of Execution and Validation Modes

- Describe the habits, routines, and implicit knowledge operating in the system.
- Identify the (explicit and implicit) validation mechanisms that sanction references.
- Apply the “How?” question to explore modes of execution.
- Apply the “Why?” (cause) question to trace the causal genealogy.

Phase 6: Normative Evaluation and Transformation Proposal

- Evaluate the viability of acts in terms of satisfaction of human needs (personal, social, and natural).
- Identify leverage points for transformation.
- Simulate the effects of possible interventions.
- Apply the criterion of internal coherence to compare systems or temporal moments.

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4. Application of the Model to the Educational System

4.1. Micro Scale: The Individual and the Classroom

At the micro level, the model focuses on the act of the student, the teacher, or the didactic interaction. The eight active questions are deployed with special attention to bodily and biographical dimensions:

- Who?: characteristics of the student or teacher: personal history, temperament, abilities, learning or teaching style.
- What?: the task, content, or situation that emerges as a relevant figure.
- How?: study habits, learning strategies, teaching style, interaction patterns.
- Why? (Purpose): motivations and purposes: learn to pass, to understand, to improve?
- Why? (Cause): genealogy of difficulties or achievements: history of couplings, previous experiences.
- How much?: emotional intensity, activation level, affective charge.
- When?: learning rhythms, activity sequencing, critical moments.
- Where?: material conditions of the classroom, social niche, available affordances.

Stakeholder analysis at this scale includes the student, teacher, parents, peers, and counselor. Relevant moments are daily activity, assessment, and transitions between levels.

4.2. Meso Scale: The School and Community

At the meso level, the model focuses on the school organization and its community. The system configuration is applied with special attention to institutional dimensions:

- Who?: the school as an organization, management team, teaching staff, educational community.
- What?: the educational project, curriculum, coexistence norms that emerge as relevant figures.
- How?: decision-making processes, leadership styles, organizational routines.
- Why? (Purpose): school mission, strategic objectives, educational purposes.
- Why? (Cause): school history, educational policies that condition it, sociodemographic context.
- How much?: school climate, level of conflict, team cohesion.

- When?: educational cycles, planning and evaluation moments, transitions.
- Where?: neighborhood, community, physical and social environment of the school.

Stakeholder analysis at this scale includes management, teaching staff, students, families, non-teaching staff, educational administration, unions, and local community. Relevant moments are the development of the educational project, annual planning, evaluation processes, and curricular reforms.

4.3. Macro Scale: National and International Educational Systems

At the macro level, the model focuses on the educational system as a whole and its relationships with other systems. The matrix of agents' intentions is applied to the political and administrative levels:

- Who?: Ministry of Education, political parties, social agents, international organizations.
- What?: educational policies, reforms, programs, evaluation reports.
- How?: policy formulation processes, implementation mechanisms, evaluation systems.
- Why? (Purpose): system objectives: inclusion, quality, equity, efficiency, competitiveness.
- Why? (Cause): system history, economic and social conditions, international influences.
- How much?: investment level, coverage, learning outcomes, inequalities.
- When?: political cycles, reform moments, external evaluation processes.
- Where?: national and international context, globalization, supranational trends.

Stakeholder analysis at this scale includes government, parliament, unions, employers' associations, parent associations, international organizations (World Bank, OECD, UNESCO), media, universities, and pressure groups. Relevant moments are the development of educational laws, external evaluation processes (PISA, TIMSS), structural reforms, and decentralization processes.

4.4. Integration Between Scales: The Multilevel Ecological Model

The power of the model lies in its capacity to integrate different scales into a multilevel ecological analysis. An educational phenomenon (e.g., school failure, segregation, teaching innovation) is better understood when analyzed simultaneously at the three levels and their interconnections. The system configuration table and the intentions matrix allow tracing how macro-level decisions condition meso and micro possibilities, and how micro-level innovations can influence higher levels.

Ecological-integral research is characterized by: (1) not reducing the phenomenon to a single level of analysis; (2) not isolating the phenomenon from its ecological context; (3) not ignoring the intentionality of agents at each level; (4) not dispensing with normative criteria based on human needs; and (5) not renouncing transformation as a research purpose.

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5. Validity and Comparison Criteria

5.1. Internal Validity: Systemic Coherence

A system is internally coherent when there is an adequate correspondence between declared ends and means employed, between proclaimed values and effective practices, and between the expectations of different agents and their actions. The agents' intentions matrix allows evaluating this coherence: if one agent's purposes systematically contradict another's, the system will tend toward dysfunction. The proposed model overcomes the problem of relativity in interpretations because it does not impose an external criterion of evaluation but assesses the system's internal coherence and its capacity to satisfy universal human needs. This allows comparing systems or temporal moments without falling into ethnocentrism or relativism.

5.2. External Validity: Evolutionary Capacity

A system is evolutionarily viable when it demonstrates capacity for: (1) learning from its mistakes and adjusting its strategies; (2) adapting to environmental changes without losing its identity; and (3) transforming in directions that better satisfy human needs at their three levels. Comparison between systems or temporal moments is carried out by evaluating their evolutionary or involutionary trend. A system that improves its internal coherence and its capacity to satisfy human needs is "more viable" than one that deteriorates them. This criterion allows for objective comparison (in the sense of being based on observable consequences) without the need to appeal to metaphysical transcendentals.

5.3. Ecological Comparison

The proposed comparison method is based on the analysis of internal coherence and evolutionary capacity of systems, rather than on comparing decontextualized point measures. Ecological comparison has the following characteristics: (1) temporality: it does not compare "snapshots" of systems at a given moment but evolutionary trajectories; (2) contextualization: it considers the uniqueness of each system (history, culture, material conditions) when

assessing its coherence; (3) multidimensionality: it evaluates multiple dimensions (access, retention, classification, location) and their interrelation; (4) participation: it involves stakeholders in defining comparison criteria; and (5) transformative purpose: comparison serves to identify leverage points and design interventions, not just to classify systems.

5.4. Educational Quality Evaluation According to the Ecological-Integral Model

To exemplify the application of the model, Table 4 presents ecological indicators of educational quality from the perspective of each agent, understood as the capacity of systems to satisfy the human needs of all involved, not as an isolated measure.

Level	Quality Indicators
Macro (Policy)	Existence of participatory mechanisms and accountability; resource allocation according to needs, not power; normative framework protecting educational rights; policies reducing segregation and exclusion
Meso (School)	Climate of collaboration and participation in decision-making; flexible use of spaces and times to respond to diverse needs; formative and improvement-oriented assessment; capacity for innovation and adaptation to context
Meso/Micro (Teacher)	Active and collaborative methodologies integrating diversity; attention to emotional and relational dimension of learning; genuine inclusion of students with different abilities; continuous training and support for professional development
Micro (Student)	Development of cognitive, social, and emotional capacities; meaningful and functional learning for life; active participation in knowledge construction; well-being and sense of belonging to the group

Table 4. Ecological indicators of educational quality by levels of agency

These indicators are not universal checklists but guiding criteria that must be adapted to each specific context. Their value lies not in mechanical application but in their capacity to guide reflection and transformation of educational systems from an ecological and human needs-based perspective.

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6. Conclusions and Projections

The comprehensive research model for complex systems at different scales based on an ecological perspective that we have presented offers a robust alternative to the objectivist, logicist, individualist, and reductionist paradigm that has dominated the social and educational sciences. Its theoretical foundations—intentionality as a universal property of living systems, the multilevel ontology of agents and functional components, stakeholder analysis and their changing roles, and the complexity of sociocultural systems—provide a coherent and empirically grounded framework for understanding the dynamics of educational and social systems.

The proposed methodology, integrating the eight active questions, multilevel stakeholder analysis, and systemic configuration, offers concrete tools for researching and transforming behavior at different scales. The distinction between micro, meso, and macro scales, and their integration, allows overcoming the reductionism of approaches limited to a single level of analysis.

The validity criterion of the model—the satisfaction of limited and universal human needs at the personal, social, and natural levels—provides an immanent normative basis that avoids both relativism and appeals to metaphysical transcendentals. Ecological comparison, based on internal coherence and evolutionary capacity of systems, offers an alternative to the comparison of decontextualized point measures.

The projections of this model are multiple: (1) educational research: design of comparative studies that contemplate the complexity of educational systems in their global and unique context; (2) policy evaluation: analysis of coherence between declared purposes and actual effects of educational policies; (3) school improvement: identification of leverage points for the transformation of educational institutions; (4) teacher training: development of competences for ecological analysis of educational situations; and (5) curriculum design: elaboration of curricula that consider the needs of all stakeholders.

Intentionality, understood as the very logic of life, and human needs, understood as the immanent criterion of viability of our acts, are the two pillars on which a truly integrated science of behavior at the service of life can be built.

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